· COLORADO RIVER ·

AQUEDUCT NEWS

THE METROPOLITAN WATER DISTRICT

OF SOUTHERN CALIFORNIA

Vol. VIII

May 30, 1941

No. 5



View of Colorado River below Parker Dam with a backstop of desert grandeur. Photographic Study by District Photographer Walter Winzell.

· COLORADO RIVER ·

306 WEST THIRD ST. Los Angeles, California

Published monthly in the interest of Field and Office Workers on the Colorado River Aqueduct, and for the information of all other citizens of the Metropolitan Water District.

May 30, 1941 Vol. VIII

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Millions Saved By District in Boulder Power Rate Cut

Taxpayers and water users in the thirteen cities of The Metropolitan Water District of Southern California will be benefited by an annual saving of \$832,000 during the next ten years and an eventual total saving of \$40,-000,000 under the terms of a new Boulder Dam power contract which was signed by Secretary of the Interior Ickes on May 29.

Approval of the contract on behalf of the Metropolitan Water District previously had been voted by the District Board of Directors.

Acting on the motion of Director Victor H. Rossetti, the Board in approving the new contract also adopted a resolution highly commending General Manager and Chief Engineer F. E. Weymouth, General Counsel James H. Howard, and Chief Electrical Engineer J. M. Gaylord for their public services in leading the long fight to secure a modification of the old Boulder Dam power contracts.

At the same time Secretary Ickes signed the new power contract with the District, he also approved new contracts with the Los Angeles Department of Water and Power and the Southern California Edison Company, which likewise effect large savings to these Boulder Dam power users. The total saving to all of the Boulder Dam power purchasers over the 50-year life of the contracts has been estimated by Secretary Ickes to amount to approximately \$120,-000,000.

The new contracts and regulations relating to generation and purchase of Boulder Dam power will take the place of contracts originally made with the Government in 1930. These contracts enabled the Secretary of the Interior, in accordance with the Boulder Canyon Project Act, to proceed with the building of the dam.

(Continued on Page 12)



First Colorado River water flows into and fills settling basin at Softening and Filtration Plant during course of preliminary tests.

Benefits of Soft and Filtered Water Come to District Cities on June 18

First delivery of soft and filtered water from the Colorado River Aqueduct will be made to the cities of The Metropolitan Water District of Southern California on June 18, according to action taken by the District Board of Directors at its meeting on May 23.

Previously the Board of Directors had indicated that first delivery of aqueduct water would be made to District cities on June 1. In a communication received by the Board from General Manager Weymouth it was pointed out that the unprecedented rains that have occurred during the past winter and early spring months had caused unavoidable delays in the completion of the aqueduct's distribution lines.

Rapid progress now being made by all of the aqueduct contractors indicates that the work will be completed by or before the middle of June, General Manager Weymouth reported. To provide a margin of safety to cover any contingencies that might arise in the concluding days of the construction work, it was decided by the Board definitely and (Continued on Page 6)

DIRECTORY

BOARD OF DIRECTORS

W. P. Whitsett, Chairman Franklin Thomas, Vice-Chairman

Glendale... Herman Long Beach....William M. Cook Los Angeles....Otto J. Emme Los Angeles...Perry H. Greer Los Angeles......D. W. Pontius Los Angeles.....John R. Richards

Los Angeles......Victor H. Rossetti Los Angeles...W. P. Whitsett Pasadena....Franklin Thomas San Marno...John H. Ramboz Santa Ana.....S. H. Finley Santa Monica...S. H. Finley

GENERAL STAFF
General Manager and Chief
Engineer...F. E. Weymouth
Asst. Chief Engineer...
Julian Hinds
General Counsel...
James H. Howard
Asst. General Counsel...
Arthur A. Weber
Chief Elec Engineer

DIVISION ENGINEERS Distribution R. B. Diemer Transmission...Robt. N. Allen Maintenance.....W. J. Neale Field. Supt. Pumping......T. T. Walsh

Aqueduct Contracts
Morris Dam Connection
C. M. Elliott and StroudSeabrook
M. W. Hongola, Supt.

Distribution System Softening and Filtration Plant Griffith Company. Weymouth

Company, weymoutney

Crowell Co., Project Manager,

Con Evans, Field Supt.

Waste Water Disposal Line

United Concrete Pipe

Corporation

Corporation

Schedule 29P

American Concrete & Steel Pipe Co.

Schedule 30SC

J. F. Shea Co., Inc.

Hollywood Tunnel

J. F. Shea Co., Inc.

Schedule 31P

United Concrete Pipe Corp.

Schedules 32CI, 33CI

Artukovich Bros.

Schedules 34P, 35P, 36P

American Concrete & Steel

Pipe Co.

Schedule 37SC

Macco Construction Co.

Schedules 38SC, 39A

Werner & Webb

Schedule 40A

Warren Southwest, Inc.

Schedule 41P

American Concrete & Steel

Schedule 41P
American Concrete & Steel
Pipe Co.
Orange County Reservoir
G. Willis & Sons, Inc., and
Charles G. Willis.



ON THE JOB AT SOFTENING AND FILTRATION PLANT

(1) Paul Bodenhofer, Chemist, at analytical balance in control laboratory. (2) Ralph Davis, Maintenance Electrician, testing automatic control equipment of zeolite softeners. (3) Carl Knoll, Chemist, at incubator in bacteriological laboratory. (4) Ray Witt and Harold Church, Head House Attendants, at control switchboard. (5) Water Treatment Engineer W. W. Aultman and Consulting Engineer J. M. Montgomery at an operating table in zeolite softener building. (6) John Peeler, Laboratory Assistant, operating sterilizing equipment. (7) Carl Knoll engaged in bacterial control. (8) Mr. Montgomery looking down Sight Well into crystal clear filtered water. (9) Carl Wilson, Consulting Water Technologist, at the microscope.

General Manager Weymouth Honored By Contractors Who Helped Build Aqueduct

A delegation of directors and members of the Southern California Chapter, Associated General Contractors, headed by former President Robert V. Edwards, appeared before the Board of Directors of the District at its meeting on May 2 and submitted a resolution highly commending the administration of Frank E. Weymouth, who is retiring as General Manager and Chief Engineer of the District on August 1.

Included in the delegation, in addition to Mr. Edwards, were J. Carson Agnew, Lynn Atkinson, H. Stanley Bent, S. M. Griffith, William A. Johnson, B. J. Ukropina, and F. J. Connolly, Manager of the Association.

Members of the delegation were general contractors who had participated in the construction of the Colorado River Aqueduct, and whose work for the District has been completed.

The resolution submitted by the delegation from the Associated General Contractors stated in part:

"BE IT THEREFORE RESOLVED, that the Southern California Chapter of the Associated General Contractors of America hereby extends to Mr. Frank E. Weymouth an expression of its appreciation for his capable leadership, his energetic management and his efficient execution of the work under his direction; and

"BE IT FURTHER RESOLVED, that the Southern California Chapter of the Associated General Contractors of America at the conclusion of the construction of this gigantic project and the retirement of Mr. Frank E. Weymouth as General Manager and Chief Engineer of the Metropolitan Water District, publicly states in behalf of its members who have performed \$120,000,000 in construction contracts on this project, the following considered opinions upon the management of Mr. Frank E. Weymouth:

"His work has been in the public interest and the results speak for themselves. The work of the Metropolitan Water District, under his management, was intelligently carried out in all its phases, including preliminary and formative work, engineering and design, preparation of specifications, execution of contracts, actual job construction and inspection and legal activities of the District.

"He has gained and retained the support and the admiration of all those with whom he was associated; public officials, his board of directors, his associates and engineering staff and the private construction firms who actually carried out the construction of the aqueduct."

After Mr. Edwards had read the resolution and submitted it to the District Board as a permanent record, he called upon several of the members of the delegation to speak briefly.

First to respond to Mr. Edwards' request was S. M. Griffith of Griffith Company.

"I have been in the contracting business for 40 years," said Mr. Griffith, "and we were fortunate, our firm, to build about \$9,000,000 worth of the aqueduct. I am proud and happy to say that we never worked with people coming so near knowing their business. Contractors don't wax very sentimental as a general thing, but it is with deep feeling I say to Mr. Weymouth, God bless and keep you."

Another to speak for the contractors was Lynn Atkinson, who said in part:

"In our dealing with Mr. Weymouth we found from the start a willingness to give us a fair hearing and a fair trial, and I am happy to feel that most of us made good. I never remember a group of contractors ever before taking time out as a group to express their high regard as we are here today to so express ourselves to Mr. Weymouth."

F. J. Connolly, Manager of the Southern California Chapter of the contractors' association, in concluding the presentation, said:

"This is the most pleasant visit I have ever made to your Board. It is a pleasure because we can say to you sincerely that everything contained in the resolution just read is a sincere, deep tribute from the human side of the contractors who have contributed and done so much in connection with the building of the aqueduct."

Others who spoke were Mr. Agnew and Mr. Johnson.

In responding to the expressions of commendation, Mr. Weymouth said:

"Of all the contractors on the aqueduct job, almost all not only tried to complete the work but to do a good job in accordance with the specifications. Of course we have had District inspectors on the work to see that they did carry out the specifications. But there has always been a willingness on the part of the aqueduct contractors and their subordinates to do the work efficiently, honestly and economically."

Construction Work Almost Completed

With the exception of a few short links of pipe line, all of the 150-mile distribution system had been completed and made ready to carry water before the end of May. Under the direction of Distribution Engineer R. B. Diemer, the contractors on the job were rapidly pushing forward with the final work.

Included in the last jobs to be finished were two short sections on the line extending from the Softening and Filtration Plant to the three Orange County cities of Anaheim, Fullerton and Santa Ana, and the Orange County Reservoir north of Brea. Work on these aqueduct features was progressing satisfactorily, and was scheduled to be completed in time for the opening day of operation tests on June 18.

On the western end of the distribution system several short sections of pipe line were being placed to complete the feeder extending from Burbank to Beverly Hills and Santa Monica. One of these pipe line sections is the one which crosses under the Los Angeles River just south of the Burbank city boundary and near the Warner Brothers motion picture studio. Here high water in the Los Angeles River occasioned by the winter rains had retarded work by the contractor on the job. During the month of May, however, work all along the line went ahead at full speed.

Although the pipe lines in the distribution system are much smaller than the huge conduits and tunnels in the main aqueduct, the work of installing these smaller units is frequently more difficult and tedious because they are located mostly in thickly populated areas and generally must be placed under heavily traveled streets already congested with a maze of utility conduits. In this connection, the District has sought to have the work done in a manner that will cause the least possible inconvenience to the public. In almost every instance, District engineers report, splendid cooperation has been given by adjoining property owners and by municipal officials.

With the completion of the last few links in the distribution system, there is being brought to a close one of the largest construction projects in America. Eight and a half years ago the first aqueduct builders moved out on the desolate desert wastes to start the big job—and since that time an army of 38,000 workmen and engineers have transformed a paper plan into the world's greatest aqueduct.



WHERE THE BIG JOB IS BEING FINISHED

(Top row of photos) Orange County feeder crossing San Jose Hills near Kellogg Ranch. (1) Lowering 39-inch precast pipe section into trench. (2) Placing concrete under pipe. (3) A completed section of line before being backfilled. (4) Orange County feeder line approaching Orange County Reservoir just over the hill. (5) Excavating for reservoir by-pass. (6) Placing pipe under railway track three miles south of Softening Plant. (7) Pipe in trench along Pomona State Highway near junction of Anaheim-Spadra Road. (8) Placing pipe sections to by-pass Los Angeles River where Burbank-Santa Monica line crosses that stream. (9) Handling steel form on a concrete air vent on the Orange County feeder. All of the scenes shown, except No. 8, are on the Orange County delivery line.

MONTHLY REPORT REVIEWS ACTIVITIES ALONG THE AQUEDUCT LINE

(EDITOR'S NOTE: The following is a brief summary of some of the activities of the District as set forth in the monthly report of General Manager F. E. Weymouth, filed with the Board of Directors in May, covering work done in April.

Miscellaneous Activities Division

During the month of April, 1941, 115 labor employment a pplicants were cleared for work on the aqueduct. Of this number, 4 were made available for force account work and 111 were made available for aqueduct contractors. Identification certificates was issued to 57 applicants. The net turnover for all positions for March, 1941, was 2.71 per cent as compared with 0.49 per cent for the same month in 1940.

Main Aqueduct

Salvage Division—Stock appraised and transferred to the Banning salvage yard to date amounts to \$2,371,428.38. Sales during April amounted to \$16,108.14. Total of salvage disbursements to date amounts to \$1,562,931.02. The appraised value of stock on hand as of April 30, 1941, amounted to \$624,463.10.

Parker Dam and Power Plant—The Bureau of Reclamation forces placed a total of 3800 cubic yards of concrete. Piers were concreted between all penstocks and form work started over the penstocks for support of the rear wall of the power house. The contractor for the steel penstocks completed all four units.

Electrical Engineering Division

Pumping Plants—The pumping plants were operated for short periods during April for testing and conditioning aqueduct structures and plant equipment.

Construction—Work was started on foundation at all plants for the gas engine driven emergency generator sets and foundation at Intake and Gene plants completed. Two of the five engine sets were delivered the last part of the month.

Civil Engineering Division

Design—Design work was completed on auxiliary equipment for Palos Verdes and Orange County chlorination stations, and design of three valve structures on the Santa Monica feeder were revised to accommodate larger valve control mechanisms.

Specifications—Specifications No. M-2145 were issued for instrument and

control panels for the Palos Verdes and Orange County chlorination stations.

Hydrography—Meetings of the Colorado River Board of California were attended and aid was given in preparing for a Colorado Basin meeting. Considerable time was devoted to annexation and water supply inquiries and problems.

Distribution Division

Field and Office Engineering—In the field, lines and grades were given, inspection provided, and quantities measured on construction work in progress. Office work consisted of revision of pipe line plan-profile drawings in connection with grade changes, and checking of progress and final payment estimates on existing contracts.

Contract Work—At the Softening and Filtration Plant, the contractor continued general clean-up, placed concrete in walks and curbs; installed plumbing fixtures; completed terrazzo and tile work and installation of building hardware. All work on the sewer and sludge lines was finished.

On the Santa Monica feeder, the contractor completed Schedule 30SC from Glendale to Burbank; finished the grouting of Hollywood Tunnel, and is now cleaning the tunnel and chipping and guniting construction joints.

On the Orange County feeder, work continued at three locations on Schedule 34P and at three locations on Schedule 35P. All pipe laying and welding was completed on Schedule 37SC from Fullerton to Santa Ana. At Palos Verdes Reservoir, the contractor worked on the chlorination meter structure. Earthwork at the Orange County Reservoir was about 75 per cent completed.

Purchasing Division

The total expenditures covered by 410 purchase orders and agreements issued by this division during the month of April, 1941, aggregated approximately \$37,700.00. Carload forwardings totaled 42, of which 32 were cement and 6 zeolite.

Accounting and Costkeeping

The total cost of the work accomplished to April 30, 1941, was \$191,-778,412.70.

Soft Water On Way

(Continued from Page 2)

officially to fix the date of the first delivery of water as of June 18.

In fixing the date for the starting of operating tests on the distribution system as of June 18, the Board also authorized the delivery of soft and filtered water without charge between the dates of June 18 and August 18 to all District cities having established connections with the aqueduct system. In this connection, it was pointed out that during the two months of operating tests the District will be able to make regular delivery of soft and filtered water.

On August 18 the aqueduct will go into regular operation, and on and after that date soft and filtered water will be sold to District cities at the rate of \$15.00 per acre foot, a rate equal to 3.5 cents per 100 cubic feet.

Up to May 30, eight of the District cities officially had notified the Board of their desire to be served with aqueduct water during the operating test period. These cities are Anaheim, Fullerton, Santa Ana, Pasadena, Beverly Hills, Santa Monica, Compton and Torrance. Other District cities have unofficially indicated their intention of taking the soft and filtered aqueduct water. It is expected that during the operating test period the District will be delivering an average of about 85 second feet, and possibly considerably more.

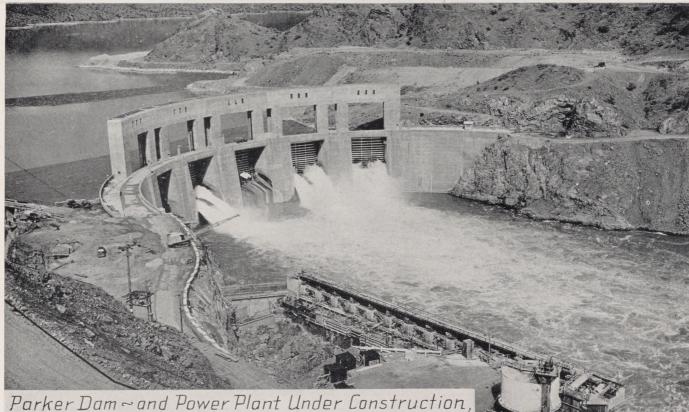
Officials of a number of the District cities have indicated that they desire to continue receiving the soft and filtered aqueduct water supplies after the system has been placed on an operating basis on August 18.

Under the direction of the consulting firm of Hoover and Montgomery, and W. W. Aultman, the District's water treatment engineer, preliminary operating tests have been under way for the past several weeks at the Softening and Filtration Plant at La Verne.

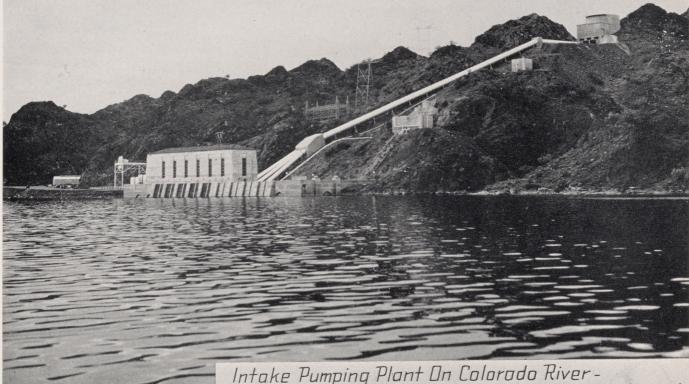
Water released from Lake Mathews has been passing through the huge plant and has been softened and filtered in exactly the same manner as it will be when the distribution system operating tests are started on June 18. Thus District engineers are being assured that when the first aqueduct water leaves the plant on June 18 for the several District cities, it will be softened and filtered precisely as desired.

At the same time all construction work on the distribution lines south and west of the Softening and Filtration Plant rapidly was being completed at the end of May.

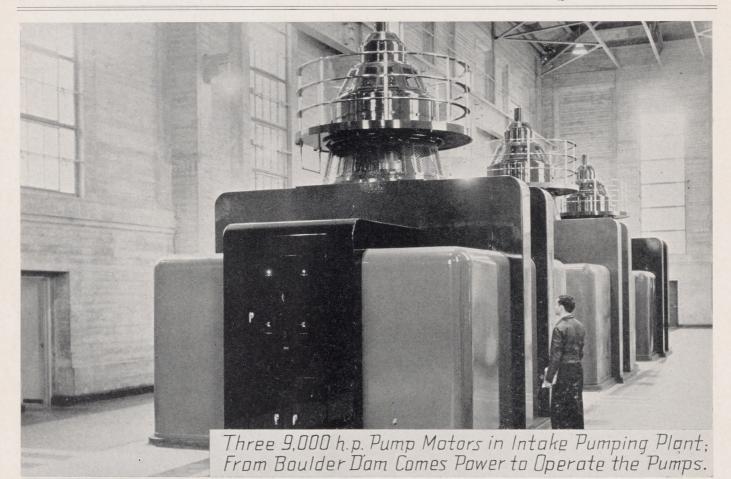
COLORADO RIVER AQUEDUCT ALBUM

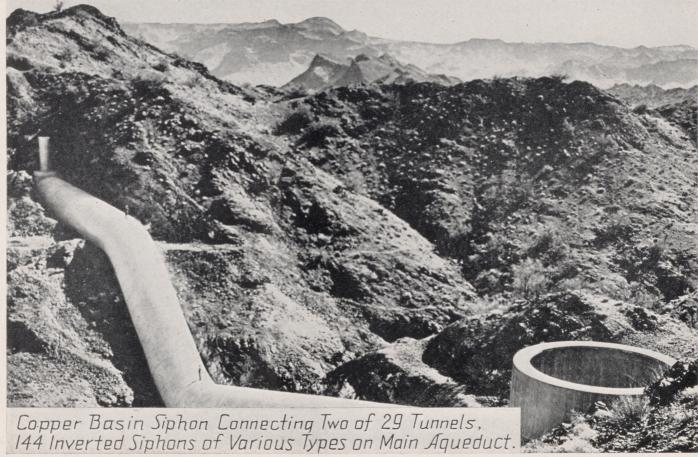


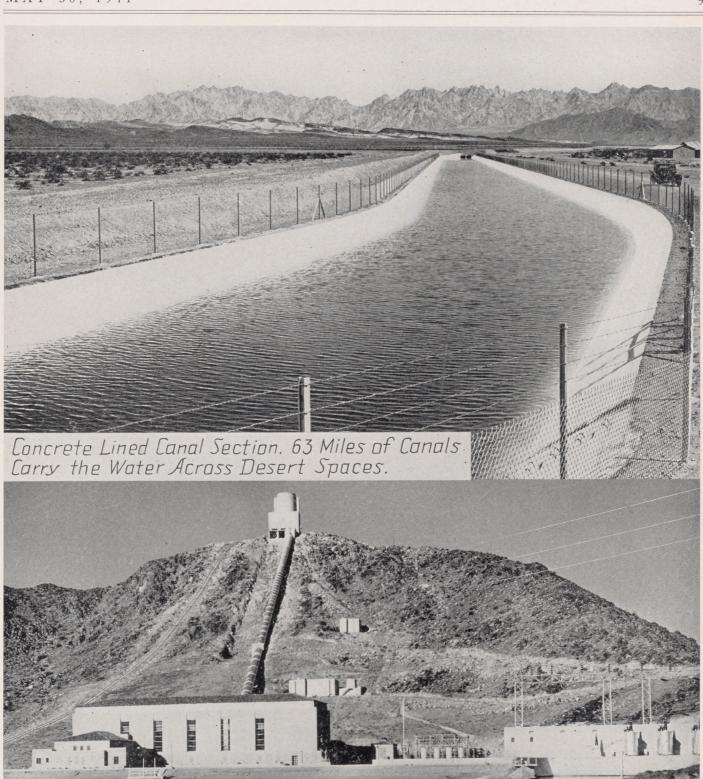
Parker Dam ~ and Power Plant Under Construction Aqueduct Intake Is Two Miles Upstream.



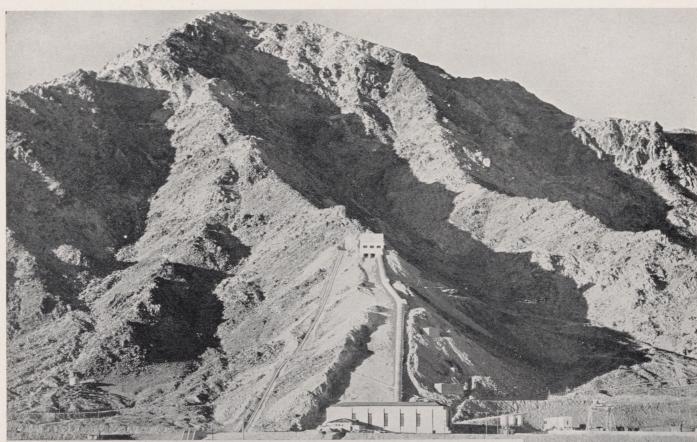
Intake Pumping Plant On Colorado River -Here Aqueduct Water Starts Long Journey Westward.



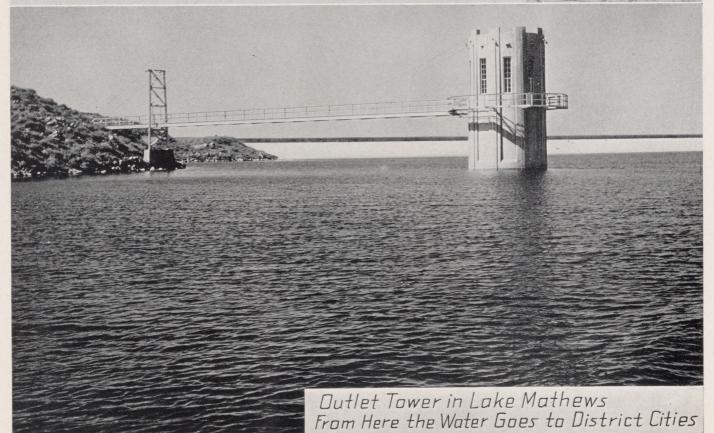




Eagle Mountain Pumping Plant, One of Five which Lift the Water 1617 Feet.



Hayfield Pumping Plant, 126 Miles West of Intake From Here the Water Flows by Gravity to District Cities



NEWS FROM FIELD AND OFFICE



Garland Gray and Wilson Pratt, District Inspectors, snapped on the job where contracting firm is completing the last links in the Orange County feeder.

D. B. (Ben) Gumensky, a five-star veteran in the aqueduct's engineering forces, resigned from his position in the Design Division on May 21 and sailed immediately for Honolulu to assume new engineering duties with the Hawaiian Dredging Company and associated contractors at Pearl Harbor. Ben first entered aqueduct service on April 11, 1929, and from that day forward he was continuously engaged in exacting design work on innumerable aqueduct structures.

During the early years of World War No. 1 Gumensky was a pilot in the Imperial Russian Air Forces. Following the overthrow of the Russian Imperial Government, he came to America and completed his engineering studies at the College of Civil Engineering of the University of California.

After having been with the District since February 1, 1933, Gregory D. Smith this month resigned his office as Assistant Controller to accept a position with the California Shipbuilding Corp., now engaged in extensive naval defense construction work on Terminal Island.

To the ever growing list of former aqueduct engineers who are now aiding in the vital work of designing and building aircraft, there was added this month the name of Galer Royer. Mr. Royer, entering the District service in February, 1933, served as Assistant Engineer on electrical transmission and design. He is now engaged in electrical engineering work with Lockheed Aircraft Corp.

AQUEDUCT TEMPERATURES
April 16, 1941, to May 15, 1941

| I | Max. | Min. |
|-------------------------|------|------|
| Gene Pumping Plant | 107 | 49 |
| Iron Mt. Pumping Plant | 104 | 50 |
| Eagle Mt. Pumping Plant | 103 | 44 |
| Banning | | 35 |
| Lake Mathews | 99 | 40 |

Resigning his position as draftsman in the Design Division on May 20, Edward C. (Eddie) Cole, has joined forces with the United States Engineers. Old subscribers of the Aqueduct News may remember some of Eddie's pen and ink sketches that appeared on the pages of this journal during heavy construction operations.

Walter Johnson, another alumnus of the District's Mails and Files Division who left the aqueduct service sometime ago to work for Lockheed, recently has been promoted to head of the mailing department of Vega Corporation. It is also understood that Walter this coming August is to be married to Miss Bettie McClintock.



"Now, where does that last piece of pipe go??!!" Wm. F. (Mac) McCleary, Reservoir Superintendent at Lake Mathews, moved over temporarily to the Softening Plant to supervise installation of sprinkler system on the grounds. There seems to be a problem involved somewhere.



What's this — a desert tank? Gilmore Smalley, Mechanic at the District's Salvage Yard at Banning, examines with apparent interest an inquisitive tortoise which invaded the salvage headquarters to look over the merchandise on hand.

Lady aqueducters from the Los Angeles office on the evening of May 21 took flight eastward and descended in force upon the premises of the Softening and Filtration Plant at La Verne. They were graciously received by Water Treatment Engineer Bill Aultman and Resident Engineer B. H. Martin, who conducted their guests through the plant and explained in great detail the intricate operations involved in the softening and filtering of the aqueduct water supply. Members of the visiting party included Orpha Bartz, Marian Crews, Viola Crutcher, Agnes Dunning, Fannie Mae Fink, Caroline Fryberg, Dorothy Goddard, Marjorie Howell, Grace Jessup, Ethel Lockhart, Edith Mallery, Vera Mayer, Estelle McGee, Elvira Meyrer, Hortense Miller, Thelma Odell, Mary Prall, Helen Scherer, Dolores Sholz, Margaret Swank, Ruth Thiers and Elisabeth von Hagen.

Another old-time aqueducter who this month left the District service to take up employment with the California Shipbuilding Corp. is Vernon C. Glass. Vernon first came with the District in October, 1933. He was employed in the Mails and Files Division, and was particularly engaged in the exhibiting of District motion picture films and supervising the cutting and cataloging of the thousands of feet of motion picture film which tell the story of aqueduct construction progress.

Power Costs Cut

(Continued from Page 2)

In its contract with the Government, the District is allotted 36 per cent of the firm energy generated at Boulder Dam. This power is used to operate the five pumping plants which lift aqueduct water a total height of 1617 feet in crossing mountain barriers that stand between the river and the thirteen cities of the Water District.

Authority to negotiate new power contracts on the basis urged was secured by the adoption by Congress in 1940 of the Boulder Canyon Project Adjustment Act. Since the passage of this act representatives of the Metropolitan Water District, the City of Los Angeles and others actively have been working with officials of the Department of the Interior to secure more favorable and equitable rates.

Under the terms of the new contracts the rate for firm energy at Boulder Dam is fixed at 1.163 mills per kilowatt hour, as compared to a rate of 1.63 mills per kilowatt hour under the original contracts.

The new contracts now in effect will—

(1) Eliminate the competitive system of fixing rates and set up an amortization basis of rate fixing.

(2) Reduce the interest rate on all Government advances to the Colorado River Dam fund from 4% to 3%.

(3) Eliminate \$25,000,000, allocated to flood control, from the repayable advances.

(4) Provide for fixed payments to Arizona and Nevada (\$300,000 each) in lieu of the uncertain percentage allowed under the original Project Act.

(5) Provide for the payment into a fund, to be known as the Colorado River Development Fund, of \$500,000 a year to be expended for the development of the Basin.

The following, in part, is the Board's resolution commending Mr. Weymouth, Mr. Howard and Mr. Gaylord for their valuable services in the successful effort to secure the new Boulder power contracts:

"Whereas, the District's General Manager and Chief Engineer, Frank E. Weymouth, several years ago forcefully drew attention to the fact that it is not equitable for the Government to require the Metropolitan Water District and other power purchasers to pay power rates that will return to the Government far more money than is required to repay the cost of the dam and to meet other proper obligations in connection therewith, and



After the long, long years of directing the planning and building of the giant Colorado River Aqueduct, General Manager and Chief Engineer Weymouth looks upon the flood of water as it courses westward in an Aqueduct canal toward the thirteen cities of the Metropolitan Water District. It is a mighty dream transformed into reality.

"Whereas, to remedy this inequity, Mr. Weymouth conceived and urged the adoption of an effective plan whereby the District and other power purchasers would be required to pay Boulder Dam power rates no higher than the amount required to repay the cost of Boulder Dam and meet other proper obligations, and

"Whereas, the District's General Counsel, James H. Howard, assisted by the District's Chief Electrical Engineer, James M. Gaylord, drafted a law granting to the Secretary of the Interior authority to enter into new contracts with the District and other Boulder Dam power purchasers which would make this plan operative, and

"Whereas, the law was enacted by Congress and, in conformity with the terms of this law, new contracts have been drawn up between the Government and the District and other Boulder Dam power purchasers, and

"Whereas, under these new contracts the taxpayers and water users of The Metropolitan Water District of Southern California will save approximately \$40,000,000 during the life of the contract over a period of 50 years, and the other power purchasers will save about \$80,000,000,

"Now, Therefore, Be It Resolved, that the Board of Directors of the District does hereby com-

mend Mr. Weymouth for his foresight in clearly realizing the need for the modification of the original Boulder Dam power contracts and his notable public service in furthering the actual accomplishment of such a modification, and

"BE IT FURTHER RESOLVED that the Board of Directors does hereby commend Mr. Howard and Mr. Gaylord for their valuable contributions in assisting in this accomplishment."

Aqueduct Album

This issue of the NEWS contains four pages of photographs of notable features of the main aqueduct system as they appear today ready to go into operation, delivering water to the cities of the District.

As will be noted, all of the photographs are of structures or equipment included in the 242-mile main line of the aqueduct, which extends from the Colorado River to Lake Mathews.

Even on the main aqueduct it was possible, of course, to present only representative features. Many notable structures, including two additional pumping plants, are not given in this album. Likewise, it was not possible to give views of the 92 miles of tunnels and 54 miles of covered conduits, since these links in the aqueduct line now lie buried underground.